AMENDMENTS TO THE CLAIMS

The claims in this listing will replace all prior versions, and listings, of claims in the application.

Listing of Claims:

1. (Currently Amended) Method for producing an ultrabarrier layer system comprising vacuum coating on a substrate a layer stack comprising an alternating layer system of at least one smoothing ~~layers~~ layer and transparent ceramic layers, and comprising the at least one smoothing layer between two transparent ceramic layers, which transparent ceramic layers are applied by sputtering, and a monomer is admitted into an evacuated coating chamber in which a magnetron plasma is operated during deposition of the at least one smoothing layer.

2. (Previously Presented) Method according to claim 1, wherein, during the deposition of the at least one smoothing layer, the magnetron plasma is operated in a pulsed manner with a pulse frequency of 1 kHz to 300 kHz.

3. (Previously Presented) Method according to claim 1, wherein, to maintain the magnetron plasma during the deposition of the at least one smoothing layer, a magnetron is used that is equipped with a target that is made of a material that can be reactively converted with nitrogen or oxygen.

4. (Previously Presented) Method according to claim 1, wherein a double magnetron is used to maintain the plasma during the deposition of the at least one smoothing layer.

5. (Previously Presented) Method according to claim 1, wherein a noble gas is used as a working gas.

6. (Previously Presented) Method according to claim1, wherein hydrocarbons, silanes, Si-organics or organometallics are admitted as monomers.

7. (Previously Presented) Method according to claim 1, wherein at least one of oxygen, nitrogen and hydrogen is admitted as reactive gas in addition to the admission of monomers during the deposition of the at least one smoothing layer.

8. (Previously Presented) Method according to claim 1, wherein a process pressure of 0.1 Pa to 10 Pa is set during the deposition of the at least one smoothing layer.

9. (Previously Presented) Method according to claim 1, wherein the deposition of the transparent ceramic layers takes place through magnetron sputtering.

10. (Currently Amended) Method according to claim 9, wherein the deposition of the transparent ceramic layers takes place through reactive magnetron sputtering, and at least one of nitrogen, oxygen, and hydrogen is admitted as reactive gas.

11. (Previously Presented) Method according to claim 1, wherein Al_2O_3 is deposited as a transparent ceramic layer.

12. (Previously Presented) Method according to claim 1, wherein SiO_2 is deposited as a transparent ceramic layer.

13, (Previously Presented) Method according to claim 1, wherein SiN is deposited as a transparent ceramic layer.

14. (Previously Presented) Method according to claim 1, wherein the coating is performed on stationary substrates.

15. (Previously Presented) Method according to claim 1, wherein the coating is performed on moving band-shaped substrates.

16. (Previously Presented) Method according to claim 1, wherein the substrate temperature is kept at below 200°C during the coating.

17. (Previously Presented) Method according to claim 1, wherein the coating is performed on plastic substrates.

18. (Previously Presented) Method according to claim 1, wherein at least one of coating rates and substrate speed is adjusted such that plasma polymer layers are deposited as smoothing layers with a layer thickness of 50 nm to 5 µm and transparent ceramic layers are deposited with a layer thickness of 5 nm to 500 nm.

19. (Previously Presented) Method according to claim 1, wherein the alternating layer system is deposited by a magnetron arrangement in the plasma of which alternately a monomer and a reactive gas is admitted.

20. (Previously Presented) Method according to claim 19, wherein the deposition of the alternating layer system takes place through alternating admission of HMDSO and oxygen.

21. (Previously Presented) Method according to claim 19, wherein, during the deposition of the alternating layer system, flows of monomer and reactive gas and/or working gas admitted are gradually changed and at least at times occur simultaneously so that individual layers of the alternating layer system merge into one another in a gradient form.

22. (Previously Presented) Method according to claim 19, wherein reactive gas and monomer are admitted via a common gas intake.

23. (Previously Presented) Method according to claim 1, wherein the alternating layer system is deposited by at least one magnetron arrangement and admission of monomer and reactive gas and/or working gas takes place at different sites so that the layers of the alternating

layer system are deposited successively when passing through a coating region on a moving substrate.

24. (Previously Presented) Method according to claim 1, wherein the alternating layer system is deposited by at least one magnetron arrangement and admission of monomer and reactive gas and/or working gas takes place at different sites so that a clear partial pressure gradient between the admitted gases develops in the region of the magnetron plasma such that when passing through the coating region on a moving substrate layers are successively deposited which merge into one another in a gradient form.

25. (Previously Presented) Method according to claim 23, wherein the substrate comprises a moving substrate guided through the coating region several times.

26. (Previously Presented) Method according to claim 23, wherein the deposition of the alternating layer system takes place through the simultaneous admission of HMDSO and oxygen.

27. (Currently Amended) Method according to claim 23, wherein reactive gas and working gas are admitted via a common gas intake.